

What is claimed is:

1. A Doherty amplifier comprising:
a coupler for splitting an input signal;
5 an envelope detector for detecting an envelop voltage
from one part of the input signal;
a plurality of envelope shaping circuits for
transforming the envelope voltage of the input signal; and
a plurality of amplifiers for amplifying the other
10 part of the input signal under control of the transformed
envelope voltage provided from the envelope shaping circuits.
2. The Doherty amplifier of claim 1, wherein one of the
plurality of amplifiers functions as a carrier amplifier and
15 the other amplifiers function as peaking amplifiers.
3. The Doherty amplifier of claim 2, wherein one of the
pluralities of envelope shaping circuits is coupled to the
carrier amplifier and the other envelope shaping circuits
20 are coupled to the peaking circuits.
4. The Doherty amplifier of claim 3, wherein a
transformed envelope signal from one envelope shaping
circuit is added with V_{DC} and applied to the carrier
25 amplifier as a drain bias signal and other shaped envelope
signals from the rest of the envelope shaping circuits are

applied to the plurality of peaking amplifiers as a gate bias signal.

5. The Doherty amplifier of claim 3, wherein the shaped envelope signal from one envelope shaping circuit is applied to the carrier amplifier as a gate bias signal and other shaped envelope signals from the rest of the envelope shaping circuits are added with V_{DC} and applied to the plurality of peaking amplifiers a drain bias signal.

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6. The Doherty amplifier of claim 1 further comprising an input matching network and an output matching network, the input matching network being disposed between the coupler and input part of the amplifiers and the output matching network being disposed at output part of the amplifiers.

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7. The Doherty amplifier of claim 5, wherein the input matching network and the output matching network include quarter-wave transformer lines.

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8. The Doherty amplifier of claim 2, wherein each of the plurality of the peaking amplifiers connected in cascade is coupled to the corresponding envelope shaping circuit for providing bias signal.

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9. The Doherty amplifier of claim 2, wherein each of the

plurality of the peaking amplifiers connected in parallel is coupled to the corresponding envelope shaping circuit for providing bias signal.

5 10. A Doherty amplifier using an adaptive bias control, comprising:

 a coupler for splitting an input signal;

 a delay line for transferring one part of the input signal;

10 an envelope detector for detecting envelope voltage as an envelope signal from the other part of the input signal;

 a first envelope shaping circuit for transforming the envelope signal from the envelope detector and applying the transformed envelope signal as a gate control bias voltage
15 to a corresponding amplifier;

 a second envelope shaping circuit for transforming of the envelope signal from the envelope detector and applying a drain control bias voltage to corresponding amplifier, the drain control bias voltage is the transformed envelope
20 signal and V_{DC} ;

 a carrier amplifier for amplifying the other part of the input signal, the carrier amplifier being controlled by the drain bias voltage from the second envelope shaping circuit;

25 a peaking amplifier for amplifying the other part of the input signal, the peaking amplifier being controlled by

the gate bias voltage from the first envelope shaping circuit;

an input matching network disposed between the delay line and the carrier and peaking amplifiers for input
5 impedance matching; and

an output matching network coupled to the outputs of the carrier and peaking amplifiers so as to combine the outputs of the amplifiers.